



Peter Brinton <peterbrinton@utah.gov>

Re: Research Project

Peter Brinton <peterbrinton@utah.gov>

Fri, Jul 29, 2016 at 2:12 PM

To: Bruce Allen <ballen@usg.com>

Cc: Paul Baker <paulbaker@utah.gov>, Jennifer Macadam <jennifer.macadam@usu.edu>, Robert Fitts <robertfitts@utah.gov>, Beth Carlson <beth.carlson@aggiemail.usu.edu>

Hi Bruce,

Regarding the phone message I left this afternoon, please see the attached USU proposal for studying restoration of threadleaf buckwheat from Professor Jennifer MacAdam. This proposal has some funding, and Professor MacAdam would like to request USG permission to take soil samples from USG lands, with her desire being to coordinate a sampling visit in August sometime. It looks like Robert Fitts (USU/DWR) may also need your permission to come sometime to collect buckwheat seed at some point.

For questions about the project, please contact Professor MacAdam, whose contact info is in the forwarded email.

The Division sees the study generally as a good way to gain information about the buckwheat's revegetation potential (including hopefully on mined areas) and associated ways to mitigate impacts, particularly if the plant were to be listed. If you have any related questions about permitting and reclamation requirements, please give us a call.

Thanks. We would like to participate in the sampling visit as possible, possibly in conjunction with a formal Division inspection.

Peter

----- Forwarded message -----

From: **Jennifer MacAdam** <jennifer.macadam@usu.edu>

Date: Thu, Jul 21, 2016 at 5:43 PM

Subject: Re: Research Project

To: Peter Brinton <peterbrinton@utah.gov>, Robert Fitts <robertdrake.fitts@aggiemail.usu.edu>

Cc: Beth Carlson <beth.carlson@aggiemail.usu.edu>, Paul Baker <paulbaker@utah.gov>

Thanks, Peter

I'm most available to travel, except for a few days, during the first four weeks of August. After that, I'll have to plan around my teaching schedule. I'll attach the proposal that was submitted to the UNPS.

Best regards,

Jennifer

Jennifer MacAdam, Professor

Dept. of Plants, Soils, and Climate

Utah State University

4820 Old Main Hill

Logan, Utah 84322

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<https://psc.usu.edu/htm/people/faculty/memberID=45>

<http://scholar.google.com/citations?user=6jAaCW4AAAAJ&hl=en&oi=ao>



MacAdam Proposal.docx

149K

Utah Native Plant Society – Grant-in-Aid Program

Applicant: Jennifer MacAdam, Associate Professor (Plant Physiology)
4820 Old Main Hill
Dept. of Plants, Soils and Climate
Utah State University
Logan, Utah 84322-4820

Date: April 15, 2016

Title: Developing a Restoration Strategy for *Eriogonum mitophyllum* Reveal

As of 09 January 2015, *Eriogonum mitophyllum* Reveal (Lost Creek Buckwheat) is listed as an extremely high priority plant species in the Utah Rare Plant Guide. As described by Reveal (2004), this species is found only on the Arapien Shale badlands west of Lost Creek and south of Salina in Sevier County, Utah. It is native to a location subject to mining and recreational activities that put the long-term survival of the species at risk. The objective of this study is to define optimal conditions for propagation of this species from seed to support the long-term goal of active reintroduction.

Seed will be collected from the native population in collaboration with Robert Fitts, Utah Natural Heritage Program. Soil samples will be taken from within the boundaries of the growth habitat, if possible, and from outside the boundary of the habitat. This will be done to identify soil characteristics of potential importance to species adaptation, including texture, pH and EC. Soil samples will be characterized in detail in collaboration Dr. Paul Grossl, soil biogeochemist at Utah State University. Site descriptors that differ from Reveal (2004) will also be noted. We will seek permission to collect a sufficient amount of soil meeting habitat characteristics to use in greenhouse germination and establishment studies, without disturbing the habitat.

In autumn of 2016, germination requirements will be determined. We do not expect a ripening period to be required before initiating a germination study because none has been observed in other *Eriogonum* species (Meyer and Paulsen, 2000).

Some *Eriogonum* species are non-dormant while others require stratification (chilling). Generally, the stratification period increases with habitat elevation, and can be as long as 24 weeks (Meyer and Paulsen, 2000). *E. mitophyllum* is sometimes listed as *Eriogonum brevicaule* var. *mitophyllum* (Reveal) S.L.Welsh, and the chilling requirement for *E. brevicaule* is reported to be 15-16 weeks (Meyer and Paulsen, 2000). In a previous study at Utah State University (Jeppson, 2006), *E. brevicaule* germinated after 10 weeks at 4 °C. Therefore, we will plan to stratify seed for 10 to 16 weeks at 4 °C.

Upon germination, seed will be placed in Containers filled with soil from or near the native habitat and amended as recommended by Dr. Grossl. Seedlings will be cultivated in a seedling

(low-light), temperature- and humidity-controlled growth chamber. As time allows, we will build on successful germination and establishment to cultivate plants at the USU research greenhouse for a future study of active reintroduction.

Timeline

Seed will be collected at the end of the growing season in 2016. Considering the expected stratification requirement, germination and transplanting will occur during the winter of 2016-17. Establishment of seedlings, if successful, will occur during the spring of 2017.

Additional personnel

Beth Carlson is an undergraduate student at Utah State University who will collect seed during the summer of 2016.

References

Jeppson, R.N. 2006. Salinity tolerance of eight *Eriogonum* species under sodium and potassium salinity. Master's Thesis, Utah State Univ.

Meyer, S.E. and A. Paulsen. 2000. Chilling requirements for seed germination of 10 Utah species of perennial wild buckwheat (*Eriogonum Michx* [Polygonaceae]). *Native Plant Journal* 1:18-24.

Reveal, J.L. 2004 *Eriogonum mitophyllum* Reveal. *Phytologia* 86:140-142.

Budget

Travel to native population site	
One round trip, 454 miles, @ \$0.485/mile	\$220.00
Undergraduate wages, 35 hours @ \$8/hour	\$280.00
Total request	\$500.00

In-kind support for this project will be provided in the form of supplies, summer salary hours for Drs. MacAdam and Grossl, and the use of growth chamber and greenhouse space. The undergraduate student/s will be encouraged to apply for a USU Undergraduate Research and Creative Opportunity Grant for the spring semester of 2017.

Publication of results

The results of this study will be published jointly with active collaborators in the peer-reviewed native plant literature. The undergraduate student/s engaged in this study will be mentored through the process of data collection, encouraged to develop an article for the UNPS *Sego Lily* Newsletter, to present results of the study in an appropriate venue, and to participate in the development of the journal article.